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Case Docket No. 4120 US

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Deposited December 17, 1999

THE COMMISSIONER OF PATENTS AND TRADEMARKS

Washington, D.C. 20231

Sir:

This a request for an application under 37 CFR 1.53(b) and (f)

Transmitted herewith for filing is the patent application of

Inventor(s) Thorsten Bürger

For: METHOD AND SYSTEM FOR TRANSMITTING DATA FOR A SECURITY SYSTEM OF A
MOTOR VEHICLE

Enclosed are:

- ☒ 11 pages, Abstract, specification, and claims; unsigned declaration (1 page)
- ☒ 2 soft 8.5"x11" size sheets of drawings attached to application (Figs. 1-2)
- ☒ Filing without fee or Declaration under 37 CFR 1.53(f)
- ☒ Express Mail mailing label no. on all filed papers
- ☐ A certified copy of a German Patent Application
- ☒ Preliminary Amendment (PLEASE ENTER BEFORE CALCULATING CLAIM FEES)
- ☐ Information Disclosure Statement,

Claims as Filed

	NUMBER FILED	NUMBER EXTRA	RATE	BASIC FEE \$760.00
TOTAL CLAIMS	11 -20=	0	\$18	0
INDEPENDENT CLAIMS	2 -3=	0	\$78	0
Surcharge fee for filing under 1.53(f)				\$130.00
				\$890.00

-
- ☒ CLAIM IS HEREBY MADE OF THE BENEFIT OF THE FILING DATES OF THE German Patent Applications: 198 60 311.8 filed December 21, 1998; and 199 02 983.0 filed January 21, 1999 UNDER 35 USC 119.
-

Martin A. Farber
866 United Nations Plaza
Suite 473
New York, NY 10017
(212) 758-2878

MARTIN A. FARBER
Attorney for Applicant
Reg. No. 22,345

PTO
S. U. 51932
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Express Mail mailing label No. EI750167183US
Deposited December 17, 1999

USA Patent Application
Thorsten Bürger
METHOD AND SYSTEM FOR TRANSMITTING DATA
FOR A SECURITY SYSTEM OF A MOTOR VEHICLE

Priority: German Patent Applications
1. 198 60 311.8 filed December 21, 1998
2. 199 02 983.0 filed January 21, 1999

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R :

PRELIMINARY AMENDMENT

Please amend this application simultaneously with filing as
follows:

IN THE ABSTRACT

(UNNUMBERED PAGE 11)

Line 1, change "The ... to a" to --A--

Last line on page, delete "(Figure 1)"

IN THE SPECIFICATION

PAGE 1

Line 3, delete "Description"

Line 8, before this line, after the title, insert:

--FIELD AND BACKGROUND OF THE INVENTION--

Line 16, change "the" to --this--

PAGE 2

Line 11, before this line insert:

--SUMMARY OF THE INVENTION--

Line 11, change "specifying" to --providing--

PAGE 5

Line 1, before this line insert:

--BRIEF DESCRIPTION OF THE DRAWINGS--

Line 3, change "drawing" to --drawings--

Line 6, change the comma "," to --; and--

Line 12, before this line insert:

--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT--

IN THE CLAIMS

(APPLICATION PAGES 8-10)

Before claim 1, change "Patent claims" to --I CLAIM:--

Please amend claims 1-10 as follows:

1. (amended) A method for transmitting data for a security device, in particular for access authorization systems and/or driving authorization systems of a motor vehicle comprising the steps of transmitting [in which] data [is transmitted] over [the] air from a transmitter unit to a receiver unit, wherein, after capacitive coupling of the transmitter unit and receiver unit, transmitting the data [are transmitted] from [the] transmitter to [the] receiver using a signal which is generated by a capacitive alternating field.

2. (amended) The method as claimed in claim 1, further comprising the steps wherein, after reception of the signal, a transmitter transmits an encoded information item to the receiver on a second wireless transmission link, which information item is compared with a predefined encoded encoded information item in the receiver, and when said items correspond, a drive signal for the security device is output.

3. (amended) The method as claimed in claim 2, wherein the second transmission link for the encoded information item is implemented by [means of] inductive coupling or radio coupling.

4. (amended) A system for activating and/or deactivating a security device, in particular for access authorization systems and/or driving authorization systems of a

motor vehicle, in which an encoded information item is transmitted over [the] air between a portable transmitter and a receiver, the receiver comparing the received information item with a predefined encoded information item, and outputting a drive signal to the security device when [these] said two information items correspond, wherein the receiver (2) has a capacitive transmitter unit (10, 11) which generates a start signal (16) by means of a capacitive alternating field and transmits it to the receiver unit (13) of the transmitter (1).

5. (amended) The system as claimed in claim 4, wherein the capacitive transmitter unit (10, 11) of the receiver (2) is composed of a first capacitor (10) which is operated with an alternating current generator (11), the transmitter (1) comprising [having], for the reception of the start signal 16), a second capacitor (13) which, in the case of capacitive coupling between the transmitter (1) and receiver (2), receives the signal generated by the transmitter unit (10, 11) of the receiver (2) and passes it on to an evaluation device (4) of the transmitter (1).

6. (amended) The system as claimed in claim 4, wherein, after evaluation of the start signal (16), the evaluation device (4) generates an encoded information item (3) which [can be transmitted] is transmittable from a transmitter unit (5) of the transmitter (1) to a receiver unit (6) of the receiver (2) by means of inductive coupling or far-field coupling.

7. (amended) The system as claimed in claim 4, wherein the encoded information item (3) is modulated onto a high-frequency carrier frequency which is generated by [the] alternating current generator (11).

8. (amended) The system as claimed in claim 5, wherein the first capacitor (10) is formed between the outer shell (15) of an access device and an activation device (12) which is arranged on [the] an outer shell of the access device.

9. (amended) The system as claimed in claim 5, wherein the first capacitor (10) is formed between [the] bodywork of the vehicle and a control element which is arranged in the interior of the motor vehicle.

10. (amended) The system as claimed in claim 8 [or 9], wherein, when the activation device (12) [or the control element are] is touched by the user, the signal which is to be detected by the second capacitor (13) is amplified.

Please add the following new claim:

--11. The system as claimed in claim 9, wherein, when the control element is touched by the user, the signal which is to be detected by the second capacitor (13) is amplified.--

R E M A R K S

This amendment is being made simultaneously with filing this application. No multiple-dependent claims exist as of the filing date.


The Abstract, specification and claims have been amended in accordance with USA practice under 35 USC 112.

No multiple-dependent claims exist in this application.

Please enter this Preliminary Amendment prior to calculating the claim filing fee and prior to an action on the merits, which is respectfully requested.

Respectfully submitted,

Thorsten Bürger

By: 
MARTIN A. FARBER
Attorney for Applicant
Registered Representative
Registration No. 22,345

866 United Nations Plaza
Suite 473
New York, NY 10017
(212) 758-2878

4120

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Description

5 **Method and system for transmitting data for a security
 system of a motor vehicle**

10 The invention relates to a method for transmitting data
 for a security device, in particular for access
 authorization systems and/or driving authorization
 systems of a motor vehicle, in which data are
 transmitted over the air from a transmitter unit to a
 receiver unit, and a system for activating and/or
 deactivating a security device.

15 The publication WO 92/18732 of the generic type
 discloses a device for operating a door-lock system
 and/or alarm system in which the user carries a movable
 transmitter in which an encoded information item for
20 activating or deactivating the aforesaid security
 devices is stored. Arranged in the motor vehicle is a
 receiver device which receives the high-frequency
 signal transmitted over the air by the transmitter, and
 compares it with a reference code which is stored in
25 it. When these information items correspond, a signal
 is output to the door-lock system and/or alarm system.

30 The transmitter signal is transmitted only if the
 person carrying the transmitter is at a predefined
 distance from the motor vehicle, which distance lies
 within the range of the transmitter.

35 The transmitter is activated here by means of a signal
 from the receiver without manual intervention of the
 user. When the high-frequency radio link is used, the

information item is modulated onto a carrier frequency which is in the megahertz or gigahertz range.

However, the advanced telecommunications possibilities also permit the identification code to be interrogated in a contactless fashion over relatively large distances, unnoticed by the vehicle owner, and to be transmitted to the motor vehicle without the vehicle owner being aware of it.

The invention is thus based on the object of specifying a method in which, despite contactless interrogation of the identification signal transmitter, third parties cannot obtain authorizing access information.

The object is achieved according to the invention in that, after capacitive coupling of the transmitter unit and receiver unit, the data are transmitted from the transmitter to the receiver using a signal which is generated by a capacitive alternating field.

The advantage of the invention consists in the fact that the transmission link does not come into operation until the user, who is carrying the identification signal transmitter on his person, comes very close, up to a few millimeters. As a result, a high degree of operational security against tampering by third parties is obtained, in particular misuse through lengthening transmission link distances through relays (relay attack) is advantageously prevented. The transmission of data and thus identification is restricted to the immediate vicinity of the user.

After reception of the signal, the transmitter will advantageously transmit an encoded information item to the receiver on a second wireless transmission link, which information item is compared with a predefined encoded information item in the receiver, a drive

signal for the security device being output when said items correspond.

5 The plausibility check of the encoded information item is only carried out, in a manner known per se, in the receiver of the motor vehicle once the identification transmitter has been woken up by the start signal and identified itself.

10 The second transmission link which is provided for the encoded information item is implemented here by means of inductive coupling or far-field coupling.

15 In another refinement of the invention, a system for activating and/or deactivating a security device, in particular for access authorization systems and/or driving authorization systems of a motor vehicle is provided, in which an encoded information item is transmitted over the air between a portable transmitter and a receiver, the receiver device comparing the received information item with a predefined encoded information item, and outputting a drive signal to the security device when these two information items correspond.

25 In order to achieve the present object, the receiver has a capacitive transmitter unit in which a first capacitor is operated with an alternating current generator, the transmitter having, for the reception of the encoded information, a second capacitor which, after capacitive coupling has taken place, receives the signal generated by the transmitter unit of the receiver and passes it on to an evaluation device of the transmitter.

35 This makes it impossible, even in such a device, for the encoded start signal to be monitored without being noticed.

In a development, after the start signal has been evaluated, the evaluation device generates an encoded information item which is transmitted from a transmitter unit of the transmitter to a receiver unit
5 of the receiver by means of a far-field coupling.

The encoded information item is modulated onto a high-frequency carrier frequency generated by the alternating current generator.

10

The field of action of a capacitive transmission can be restricted to specific areas. The first capacitor is thus formed between the outer shell of an accessed device and an activation device which is arranged on
15 the outer shell of the accessed device. As a result, the start signal is not generated until the user activates, for example, the door handle of the motor vehicle.

20 In order to monitor whether the correct identification signal transmitter is present for an immobilizer, the first capacitor is formed between the vehicle bodywork and a control element located in the interior of the vehicle. This control element may be, for example, the
25 transmission shift lever of a motor vehicle.

The signal which is to be detected by the second capacitor is advantageously amplified by the user making contact with the activation device or with the
30 control element. Owing to the high level of conductivity of the human body, it acts as a capacitor electrode with a large surface for the first capacitor, and thus as a transmission medium. This ensures that the second capacitor which is arranged on the
35 identification signal transmitter reliably perceives the changes in capacitance of the first capacitor.

The invention permits numerous possible embodiments. One of them will be explained with reference to the figures illustrated in the drawing, in which:

- 5 Figure 1: shows an antitheft device according to the invention,
Figure 2: shows an embodiment of a capacitive field.

10 Identical features are identified with identical reference symbols.

In the vehicle access systems and vehicle authorization systems which are currently in development, a contactless interrogation of an identification signal
15 transmitter makes opening and starting a vehicle significantly more convenient. The identification signal transmitter can be carried here anywhere on the body (for example in a trouser pocket or a jacket pocket) and does not have to be explicitly operated.

20 Such a security device is composed of a portable transmitter 1 and a receiver device 2 which are permanently installed in a motor vehicle (not illustrated further). High-frequency radio signals 3
25 are exchanged in a contactless fashion between the transmitter 1 and the receiver device 2.

The transmitter 1 is composed here of a security code signal transmitter 4 in which the encoded information
30 item is modulated onto a carrier frequency f_0 of approximately 400 MHz. The security information which is generated in this way is passed onto a transmitter/receiver device 5 which is embodied as an antenna in the case of the transmitted radio signals 3.
35 A receiver device 6, also embodied as an antenna, of the receiver device 2 receives the radio signal 3 and passes it on to a control unit 7 of the motor vehicle which compares the encoded signal with a reference code signal stored in it. When these two information items

correspond, the control unit 7 outputs a drive signal either to the central locking system 8 of the motor vehicle in order to open or close the vehicle doors and/or to a immobilizer 9 in order to activate or
5 deactivate the drive of the motor vehicle.

The transmission of the encoded information is, however, initiated by the transmitter 1 only if the transmitter 1 receives a start signal 16 from the
10 receiver device 2.

In order to generate the start signal 16, a capacitor 10, which is operated with an alternating current generator 11, is arranged in the receiver device 2.
15 This alternating current generator 11 can be activated continuously or only at predefined time periods. In order to transmit data simultaneously, a signal which contains the data can be modulated onto the carrier frequency which is generated by the alternating
20 current generator.

As is clear from Figure 2, the capacitor electrodes of the capacitor 10 are formed by the vehicle bodywork 15 and a metal plate 12 and let into a door handle of the
25 motor vehicle.

Similarly, a capacitor 13, which is connected to the reference code signal transmitter 4 via an amplifier device 14, is also located in the transmitter device 1.

30

The start signal 16 is generated in the following way: if the user approaches the motor vehicle, the capacitor 13 of the transmitter 1 will move, when in the direct vicinity of the door handle, or when he touches it,
35 into the electrical field which is built up by the capacitor 10 between the door handle and the vehicle bodywork. As a result of the continuous change in this field owing to the driving by means of the alternating current generator, the variation in the field is

detected by the capacitor 13 of the transmitter unit 1.
Said capacitor 13 generates a signal which corresponds
to the changes and which is amplified by the amplifier
14 and passed onto the reference code signal
5 transmitter 4, which is preferably embodied as a
microcontroller.

This effect is amplified further by virtue of the fact
that the user 17 himself serves as a transmission link
10 between the transmitter 1 and receiver 2 by virtue of
the fact that the capacitive coupling is amplified even
further by the conductivity of his body.

It is possible to dispense completely with presence
15 detectors such as are used to trigger the start signal.

Mannesmann VDO AG

Kruppstraße 105
60388 Frankfurt

4120

Patent claims

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1. A method for transmitting data for a security device, in particular for access authorization systems and/or driving authorization systems of a motor vehicle in which data is transmitted over the air from a transmitter unit to a receiver unit, wherein, after capacitive coupling of the transmitter unit and receiver unit, the data are transmitted from the transmitter to the receiver using a signal which is generated by a capacitive alternating field.
2. The method as claimed in claim 1, wherein, after reception of the signal, a transmitter transmits an encoded information item to the receiver on a second wireless transmission link, which information item is compared with a predefined encoded information item in the receiver, and when said items correspond, a drive signal for the security device is output.
3. The method as claimed in claim 2, wherein the second transmission link for the encoded information item is implemented by means of inductive coupling or radio coupling.
4. A system for activating and/or deactivating a security device, in particular for access authorization systems and/or driving authorization systems of a motor vehicle, in which an encoded information item is transmitted over the air

between a portable transmitter and a receiver, the receiver comparing the received information item with a predefined encoded information item, and outputting a drive signal to the security device when these two information items correspond, wherein the receiver (2) has a capacitive transmitter unit (10, 11) which generates a start signal (16) by means of a capacitive alternating field and transmits it to the receiver unit (13) of the transmitter (1).

5. The system as claimed in claim 4, wherein the capacitive transmitter unit (10, 11) of the receiver (2) is composed of a first capacitor (10) which is operated with an alternating current generator (11), the transmitter (1) having, for the reception of the start signal (16), a second capacitor (13) which, in the case of capacitive coupling between the transmitter (1) and receiver (2), receives the signal generated by the transmitter unit (10, 11) of the receiver (2) and passes it on to an evaluation device (4) of the transmitter (1).

6. The system as claimed in claim 4, wherein, after evaluation of the start signal (16), the evaluation device (4) generates an encoded information item (3) which can be transmitted from a transmitter unit (5) of the transmitter (1) to a receiver unit (6) of the receiver (2) by means of inductive coupling or far-field coupling.

7. The system as claimed in claim 4, wherein the encoded information item (3) is modulated onto a high-frequency carrier frequency which is generated by the alternating current generator (11).

8. The system as claimed in claim 5, wherein the first capacitor (10) is formed between the outer shell (15) of an access device and an activation device (12) which is arranged on the outer shell of the access device.
5
9. The system as claimed in claim 5, wherein the first capacitor (10) is formed between the bodywork of the vehicle and a control element which is arranged in the interior of the motor vehicle.
10
10. The system as claimed in claim 8 or 9, wherein, when the activation device (12) or the control element are touched by the user, the signal which is to be detected by the second capacitor (13) is amplified.
15

Abstract

**Method and system for transmitting data for a security
device of a motor vehicle**

The invention relates to a method for transmitting data for a security device, in particular for access authorization systems and/or driving authorization systems of a motor vehicle, in which data are transmitted over the air from a transmitter unit to a receiver unit.

In a method in which, despite contactless interrogation of the identification signal transmitter, an authorizing access information item cannot be obtained by a third party, the data are transmitted, after capacitive coupling of the transmitter unit and receiver unit, from the transmitter to the receiver using a signal which is generated by a capacitive alternating field.

(Figure 1)

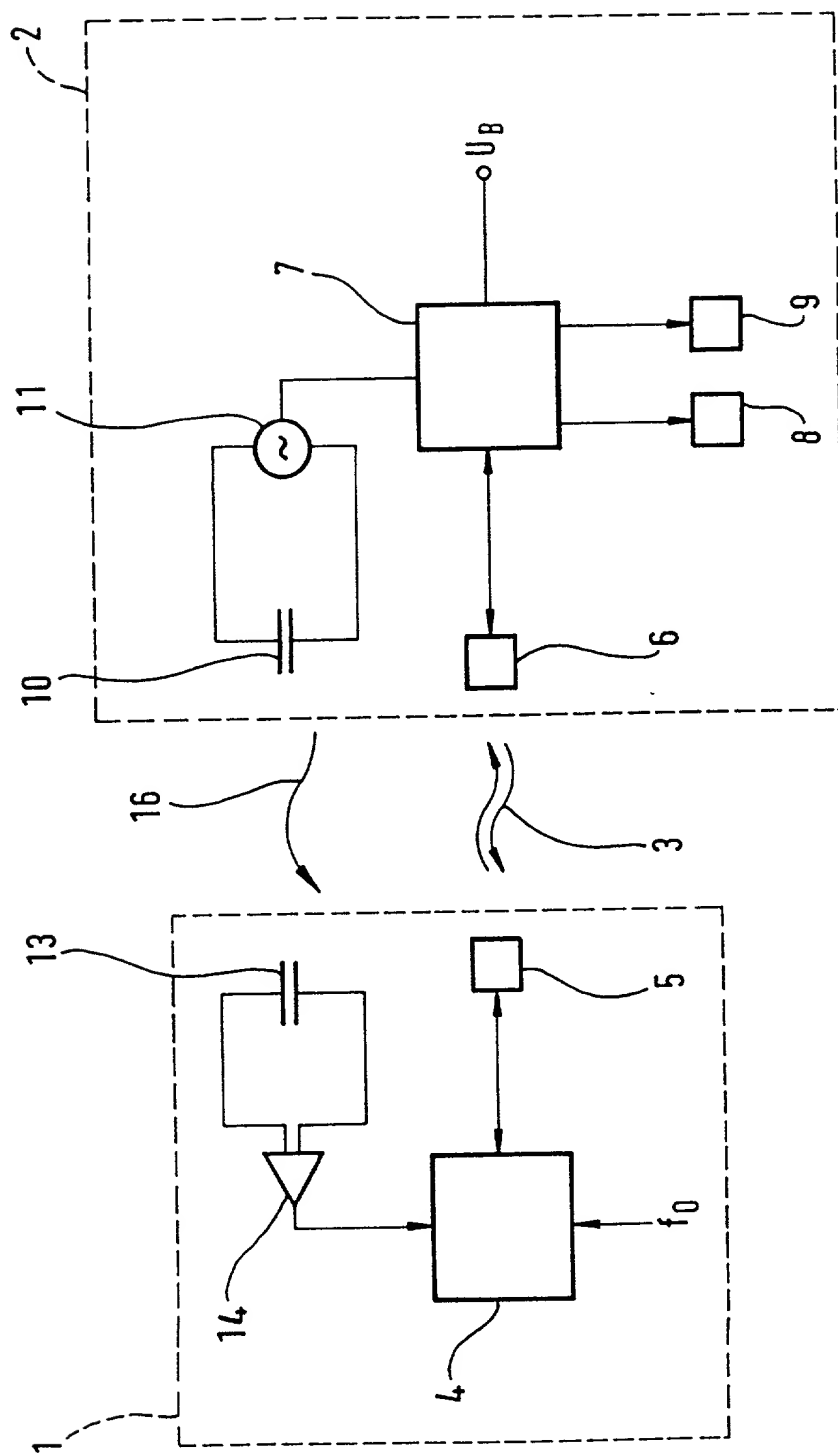


Fig. 1

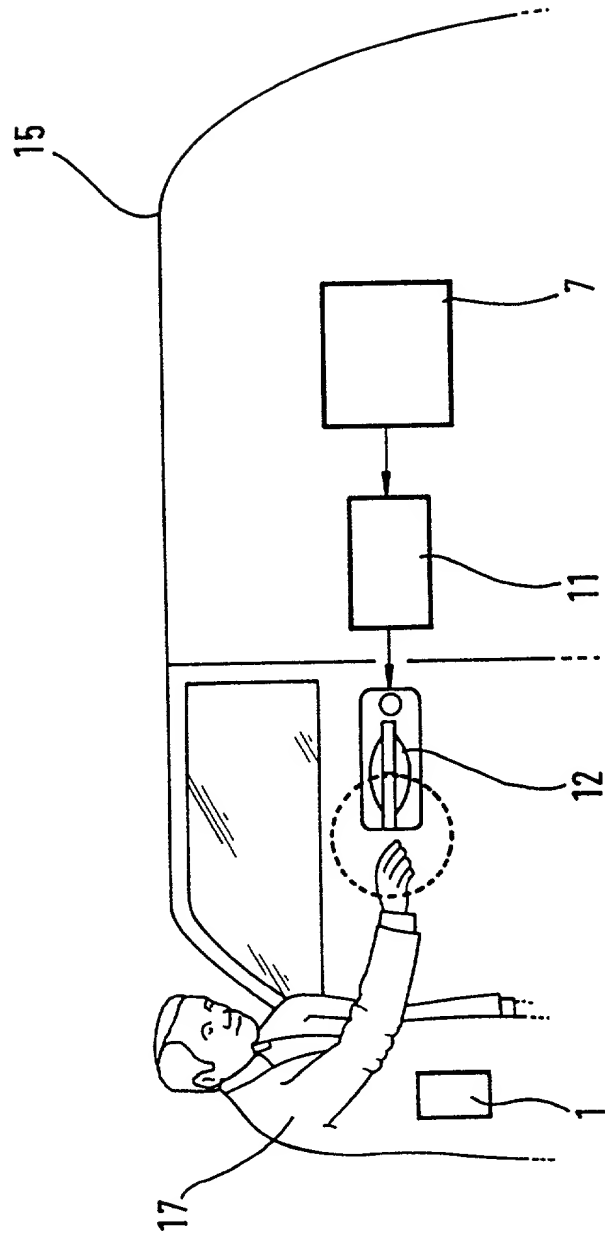


Fig. 2

DECLARATION FOR PATENT APPLICATION

Docket Number (Optional)

4120 US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

METHOD AND SYSTEM FOR TRANSMITTING DATA FOR A SECURITY SYSTEM OF A / , the specification of which

MOTOR VEHICLE

is attached hereto unless the following box is checked:

☐ was filed on as United States Application Number or PCT International Application Number and was amended on (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

<u>198 60 311.8</u>	<u>Germany</u>	<u>21/12/1998</u>	Priority Claimed
(Number)	(Country)	(Day/Month/Year Filed)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<u>199 02 983.0</u>	<u>Germany</u>	<u>21/01/1999</u>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
(Number)	(Country)	(Day/Month/Year Filed)	<input type="checkbox"/> Yes <input type="checkbox"/> No
<u> </u>	<u> </u>	<u> </u>	<input type="checkbox"/> Yes <input type="checkbox"/> No
(Number)	(Country)	(Day/Month/Year Filed)	

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

<u> </u>	<u> </u>	<u> </u>
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)
<u> </u>	<u> </u>	<u> </u>
(Application Number)	(Filing Date)	(Status - patented, pending, abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Martin A. Farber, Esq. Reg. No. 22,345
 Address all telephone calls to Martin A. Farber at telephone number (212) 758-2878
 Address all correspondence to Martin A. Farber, 866 United Nations Plaza, Suite 473
New York, NY 10017

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor (given name, family name) Thorsten Bürger
 Inventor's signature Date
 Residence Pfingstbrunnenstr. 54, Schwalbach, Germany Citizenship Germany
 Post Office Address Pfingstbrunnenstr. 54, 65824 Schwalbach, Germany

Full name of second joint inventor, if any (given name, family name)
 Second Inventor's signature Date
 Residence Citizenship
 Post Office Address

☐ Additional inventors are being named on a separate sheet attached hereto.